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TIMBER MANAGEMENT PLAN

GUNNISON WORKING CIRCLE

GUNNISON NATIONAL FOREST
Colorado
Region 2

July 1, 1962 - June 30, 1972

U. S. FOREST SERVICE

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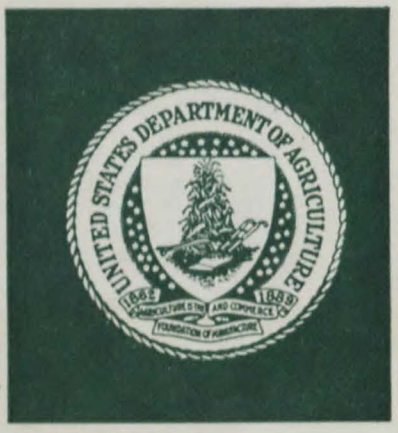

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TIMBER MANAGEMENT PLAN

GUNNISON WORKING CIRCLE

Gunnison National Forest
Colorado
Region 2

July 1, 1962 - June 30, 1972

Submitted: June 25, 1962 By /s/ James J. Ballard

Reviewed and Recommended for Approval:

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Division of Timber Management	/s/ H. C. Eriksson	7/9 1962
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Acting Regional Forester	/s/ B. K. Crane	1962

Approved August 24, 1962

/s/ A. W. Greeley
Acting Chief

(D.J.M.)

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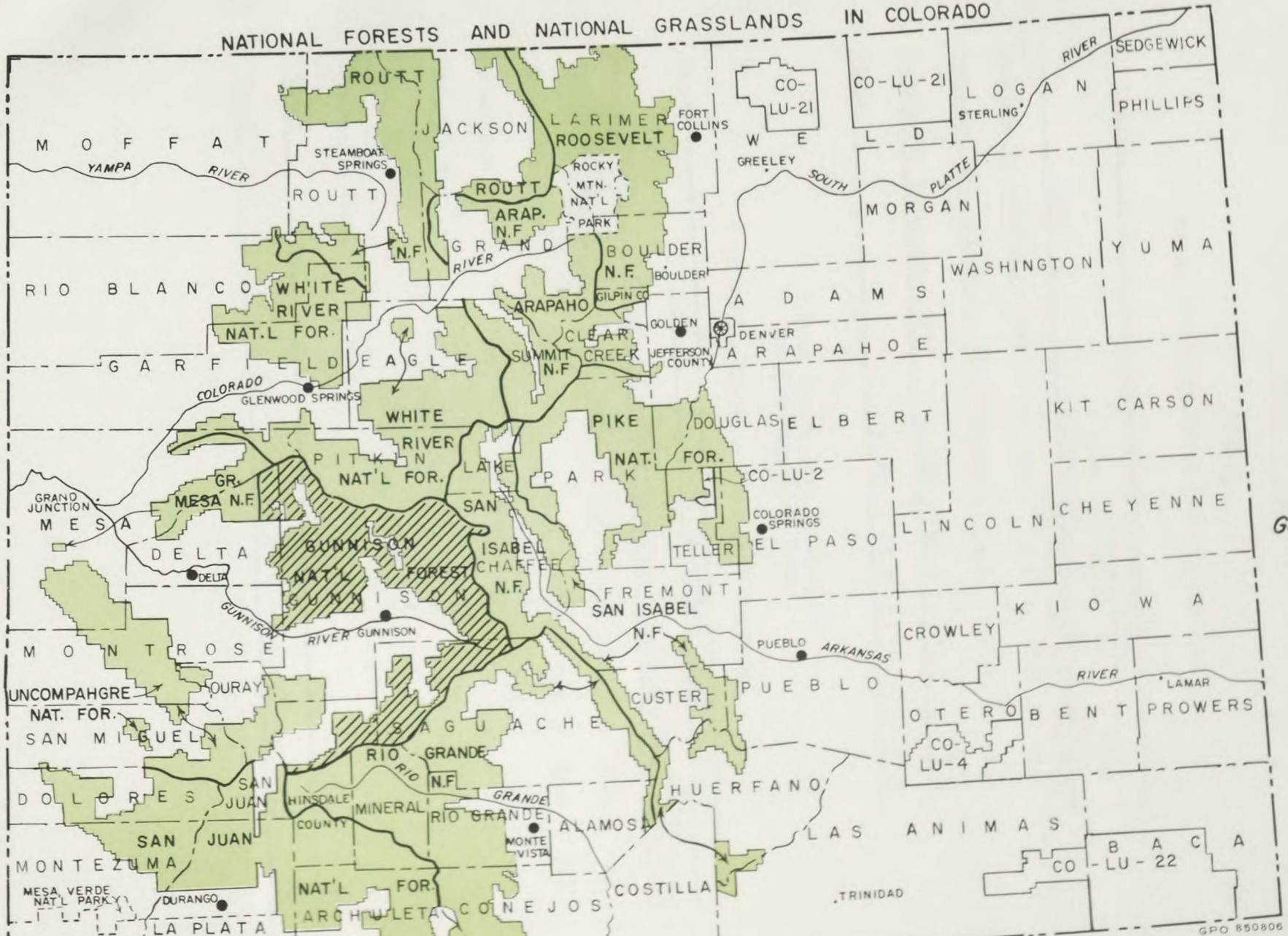
NATIONAL FORESTS AND NATIONAL GRASSLANDS IN COLORADO



GUNNISON
NATIONAL FOREST and WORKING CIRCLE

GPO 850806

SUMMARY OF PLAN

Table 1

Annual Allowable Cut For Regulated Area

Type	Area Acres	Volume Scribner Dec. C	Volume Int. ¼"	Volume Cubic Feet
		MM B.F.	MM B.F.	MM C.F.
Douglas-fir Sawtimber (D9)	530	2.3	2.9	0.7
Lodgepole Pine Sawtimber (LP9)	2,250	14.6	18.0	4.2
Spruce-Fir Sawtimber (SF9)	2,580	29.3	35.1	7.9
Total	5,360	46.2	56.0	12.8

Volume Broken Down By Species
For The Regulated Area

MM B.F. - Scribner Decimal C Log Rule

Species	Sawtimber Types: Douglas-fir	Lodgepole Pine	Spruce-Fir	Total Volume	Total Percent
Engelmann Spruce	0.3	1.9	22.3	24.5	53
Lodgepole Pine	-	12.1	0.5	12.6	27
Subalpine Fir	0.1	0.2	5.3	5.6	12
Douglas-fir	1.7	0.4	0.3	2.4	5
Blue Spruce	-	-	0.5	0.5	1
Ponderosa Pine	0.2	-	-	0.2	1
Aspen	-	-	0.4	0.4	1
Total	2.3	14.6	29.3	46.2	100

Table 2

Unregulated Types

Type	Total Area M Acres	Total Volume
Aspen	250	152 MM C.F.
Lodgepole Pine Poletimber	115	145 MM C.F.

Table 3

Area Summary By Land Classification and Stand Size Class

Thousand Acres

Land Classification and Stand Size Class	Ownership: National Forest	State	Private	Total
Commercial Forest Land:				
Sawtimber	502	2	17	521
Poletimber	453	3	22	478
Seedling-Sapling	34		2	36
Nonstocked	18		1	19
Total	1,007	5	42	1,054
Noncommercial	185	1	9	195
Non-Forest	406	6	38	450
Total	591	7	47	645
Reserved				
Productive	33			33
Nonproductive	6			6
Non-Forest	22			22
Total	61	-	-	61
Grand Total	1,659	12	89	1,760

Table 4

Area of Commercial National Forest Land
By Major Type, Stand Size Class, and Stocking Class

Thousand Acres

Type	Stand Size and Stocking Classes																Non-stocked	Grand Total	Percent
	Large Sawtimber		Small Sawtimber				Poletimber				Seedling-Sapling								
	Poor	Total	Well	Med.	Poor	Total	Well	Med.	Poor	Total	Well	Med.	Poor	Total					
Douglas-fir				26	54	80	4	23	4	31				-			-	111	11
Ponderosa Pine					2	2		2		2				-			-	4	1
Lodgepole Pine				47	52	99	42	69	4	115	6	3		9			1	224	22
White Pine Gr.								3		3							-	3	-
Spruce-Fir	1	1	1	162	142	305	8	40	18	66		1	1	2			17	391	39
Total Conifers	1	1	1	235	250	486	54	137	26	217	6	4	1	11			18	733	73
Hardwoods						15				236				23			-	274	27
Grand Total		1				501				453				34			18	1,007	100
Percent		-				50				45				3			2	100	

Table 5

Total Volume For Commercial Forest Lands
By Ownership

Ownership	Total Volume			
	Cubic Feet		Board Feet - Trees 9.0" D.B.H. and Larger	
	Trees 5.0-10.9" D.B.H. MM C.F.	Trees 11.0" D.B.H. and Larger MM C.F.	Scribner Dec. C MM B.F.	Int. 1/4" MM B.F.
Softwoods				
National Forest	612	859	4,394	5,287
State, County, etc.	3	2	12	14
Private	22	30	145	174
Total	637	891	4,551	5,475
Hardwoods				
National Forest	104	48		
State, County, etc.	1	-		
Private	5	2		
Total	110	50	-	-
Grand Total				
National Forest	716	907	4,394	5,287
State, County, etc.	4	2	12	14
Private	27	32	145	174
Total	747	941	4,551	5,475

Table 6

Total Volume of Sawtimber By Species
In Sawtimber Types

National Forest Unreserved Lands

Sawtimber Types	M B.F. By Species (Scribner Decimal C)						
	Douglas-fir	Ponderosa Pine	Lodgepole Pine	Subalpine Fir	Engelmann Spruce	Aspen	Total
Douglas-fir	243,123	17,078	6,363	14,065	48,558	5,693	334,880
Ponderosa Pine	3,841	3,143					6,984
Lodgepole Pine	20,408		529,340	7,015	80,995		637,758
Spruce-Fir	37,458		54,485	619,770	2,649,343	44,269	3,405,325
Total	304,830	20,221	590,188	640,850	2,778,896	49,962	4,384,947

Table 7

Periodic Annual Net Growth Based On
Past 10 Years

Type	Average Per Acre: Net Annual Growth Cubic Feet	Average Per Acre: Annual Mortality Cubic Feet	Total Annual Net Growth For The Working Circle: M C.F.	Total Annual Net Growth For The Working Circle: Scrib.Dec.C M B.F.
Sawtimber				
Douglas-fir	+ 3.72	0.81	296	1,200
Lodgepole Pine	+ 2.54	1.71	251	1,120
Spruce-Fir	+11.46	2.56	3,507	14,167
Total			4,054	16,487
Poletimber				
Lodgepole Pine	+8.21	1.0	539	-

Table 8

Recommended Adjustment Period and Rotation

Years

Types	Adjustment Period	Rotation
Douglas-fir	40	140
Lodgepole Pine	40	120
Spruce-Fir	100	140

Revision Date June 30, 1972

TIMBER MANAGEMENT PLAN

For The

GUNNISON NATIONAL FOREST

INTRODUCTION

This working circle plan is an action program for the 10-year period F.Y. 1963-1972. It prescribes the action necessary to meet the long-term objectives in the General Timber Management Statement for the Gunnison National Forest.

The plan will be revised by June 30, 1972. Earlier revisions may be made if necessary to meet changing conditions.

Detailed Forest Survey data, from which this plan was formulated, are on IBM sheets filed in a binder labeled "1959, Forest Survey, Colorado, Gunnison National Forest, Sample Unit 21." This binder is located in the Forest Supervisor's office at Gunnison, Colorado.

Compartment records showing area and volume breakdowns by types and compartment descriptions and maps are filed in the timber management atlas of each district ranger. These records will be posted annually for action taken within the compartment. The current actions to be recorded are -- Area and volume cut, stand improvement and slash disposal work done, fire losses, and changes in ownership.

MANAGEMENT OBJECTIVES

The objectives for the 10-year period, F.Y. 1963-1972 are:

1. Attain the allowable cut by 1972. In order to do this additional sawmills or other wood industry must be established to utilize the resources of the working circle.

2. Assure adequate regeneration of cutover stands within three years after cutting. In the spruce-fir type, cutting will be followed by site preparation measures and the planting of a minimum of 300 spruce or lodgepole pine seedlings per acre. Cutting in lodgepole pine stands will be followed by the necessary slash treatment and the removal of dwarfmistletoe infected residuals to insure disease-free reproduction.

3. Keep Engelmann spruce bark beetles below an epidemic level by treating spruce cull and slash material from sale areas by mechanical piling and burning, entire tree logging, accompanied by burning slash at landings, or by other practicable methods.

4. Examine nonstocked forest lands, apply prescribed site preparation measures, and plant 5,400 acres now nonstocked.

5. Re-establish conifers on 40,000 acres of oak brush type by mechanical site preparation and machine planting of ponderosa pine.

6. Re-establish conifers on 40,000 acres of aspen type by mechanical site preparation and planting spruce or lodgepole pine.

7. Much of the aspen type has a satisfactory stocking of spruce reproduction. Examine and treat 10,000 acres of this type to release the spruce from aspen overstory competition by aerial spraying or individual tree treatment.

8. Keep commercial forest land fire damage within the PAR established by the fire plan -- 27 acres per year.

REGULATION

Regulation will be by area with the allowable cut expressed in both acres and volume. The control of the cut will be by 10-year periods. Undercuts that have built up during the period may be cut during the remainder of the same period, provided that the total cumulative cut does not exceed the allowable periodic cut by more than 10 percent.

The allowable cut will be by type area and not by species or products cut from within the type. Sales programs will be by species and products and will be in volume sufficient to meet area control objectives. Sales programs will normally exceed allowable cut objectives; otherwise the average annual cut will fall short of meeting the 10-year objective. Emphasis will be placed on increasing the current actual cut until experience shows the allowable cut objectives are assured.

The financed cut for any one year is based upon volume and includes the cut from both the regulated and nonregulated areas. The financial cut quota should be sufficient to meet both volume and area objectives for the forest as a whole.

If the present relationship between area and volume is found to be out of proportion for the forest as a whole, the volume will be adjusted to be consistent with area regulation. No adjustment, however, will be made prior to the end of the first five years of the period.

Types to be Regulated

The spruce-fir type makes up 39 percent of the commercial forest land and 76 percent of the sawtimber volume.

The lodgepole pine type makes up 22 percent of the commercial forest land and 14 percent of the sawtimber volume.

The Douglas-fir type, although largely unmerchantable, makes up 11 percent of the commercial forest lands and 7 percent of the sawtimber volume.

The ponderosa pine type comprises less than one percent of the total commercial forest land. The type is found adjacent to the Douglas-fir type and will be harvested along with that type.

Nonregulated Types

Aspen and other hardwoods make up 27 percent of the commercial forest lands. There is no market for the species and none is expected to be developed during this ten-year period.

The limber pine type is very limited in area, and any sawtimber size trees are of such poor quality that they are classed as unmerchantable. The type will not be scheduled for harvesting and will be retained for its soil erosion control value.

Adjustment Periods and Rotations

Type	Adjustment Period	Rotation
Douglas-fir Sawtimber	40 years	140 years
Lodgepole Pine Sawtimber	40 years	120 years
Spruce-Fir Sawtimber	100 years	140 years

A 40-year adjustment period is used to convert wild stands of lodgepole pine and Douglas-fir to managed stands. A 100-year adjustment period is used for the spruce-fir type. These adjustment periods are based upon the present condition of the stands, the ability of industry to harvest the timber and the maintenance of a desirable cut after the 40-year period. It is estimated that the adjustment periods will be adequate to put the area in an acceptable growing condition by the year 2000 A.D.

The rotation periods are average for the region and are shorter than those used in previous plans. They are used in this plan only in the Kemp formula as a comparison with tabulation method for determining the allowable cut.

Methods of Cutting

Region Two's Management Guides for Lodgepole Pine, Engelmann Spruce, and Ponderosa Pine, FSH2-2442.8, will be applied in timber marking. The guides provide for clear cutting by patches, strips or groups with even-age management as the objective.

Timber management within roadsides, recreation areas, streamsides and waterfronts will be for the purpose of protecting, improving, and regenerating stands of timber that will be adequate for the use to be made of the areas.

Timber cutting within established recreation areas will be in accordance with the objectives set up in the recreation plan for the specific area.

Presale prescriptions will set up the requirements for each sale in accordance with directions in the Multiple-Use Management Guides for Western Colorado, and forest and ranger district plans.

It is essential that a good timber management job be done in order to maintain good esthetics in areas used by the general public. A complete slash disposal job will be accomplished immediately after logging in the special treatment areas. This may be by piling and burning, chipping, or other approved methods.

The Regional Forester and Forest Supervisor are authorized to make sales within their authorizations within the roadside zones of system roads, including Highway U. S. 50.

Growing Stock

The forest inventory 1957-1958 divides the major timber types into stand size classes and stocking classes or crown density classes. The definitions for the classes are the Forest Survey standards which were in effect at the time of the inventory. They are as follows:

Stand Size Classes

Sawtimber - Stands that have an average net volume per acre of 1,500 board feet (International $\frac{1}{4}$" log scale) or more in trees 11.0" and larger d.b.h.

Poletimber - Stands failing to meet sawtimber specifications, but at least 10 percent stocked with poletimber size trees and larger (5.0"+ d.b.h.). The plurality of cubic foot volume is in trees 5.0"-10.9" d.b.h.

Seedling-Sapling - Stands that do not qualify as either poletimber or sawtimber stands, but are at least 10 percent stocked with commercial species 1.0"-4.9" d.b.h.

Nonstocked - Stands that do not meet any of the above qualifications, i.e., normally less than 10 percent stocked.

Tree Size Classes

Sawtimber - Trees 11.0"+ d.b.h.

Poletimber - Trees 5.0"-10.9" d.b.h.

Seedling Sapling - Trees 1.0"-4.9" d.b.h.

Sawtimber inventory volumes as used in this plan are in trees 9.0"+ d.b.h. in the sawtimber type.

Stocking class or crown density class refers to the extent to which growing space is utilized by present growing stock trees of commercial species. The classification is based on the percent of crown closure. The stocking classes for sawtimber stands, as used in this plan, are for the percent of closure of sawtimber crowns. The stocking classes for poletimber and seedling-sapling size stands are based on crown closure for all trees regardless of their size.

Classification	Percent of Crown Closure
Nonstocked	0- 9
Poorly stocked	10-39
Medium stocked	40-69
Well stocked	70+

Condition classes were not used in the survey. The breakdown into stand size classes is purely on size and does not necessarily reflect the growing potential of the trees into the next larger stand size class. Since 45 percent of the commercial forest land is occupied by the poletimber size class, a condition survey of these stands is needed and will be made prior to the next revision of this plan.

Table 9 summarizes the distribution of stand size classes for the regulated types. This table shows that 78 percent of the spruce-fir type, 44 percent of the lodgepole pine type and 72 percent of the Douglas-fir type are of merchantable size for sawtimber. Due to their age, these stands are, in general, ready for harvest.

The operability factor was obtained by estimating the percent of the stands that could economically be harvested during the rotation period. The cost of roads in relation to the volume of timber is the determining factor. Some of the stands will not be operable until all-purpose road funds make such stands accessible.

Also, in estimating operability, a fringe of timber near timberline was considered unmerchantable because of poor tree quality and watershed protection needs. In the Douglas-fir type particularly, poorly stocked stands on steep, rocky slopes are considered unmerchantable.

Table 9

Distribution of Stand Size Classes
For Regulated Types

Stand Size Class	Spruce-Fir			Lodgepole Pine			Douglas-fir		
	M Acres	Percent of Type	Percent Operable	M Acres	Percent of Type	Percent Operable	M Acres	Percent of Type	Percent Operable
Sawtimber	306	78	80	98	44	90	80	72	25
Poletimber	65	17		115	52		31	28	
Seedling-Sapling	2	1		9	4		-		
Nonstocked	17	4		1	-		-		
Total	390	100		223	100		111	100	

Growth and Mortality

Growth and mortality are based on Forest Survey data for the past 10 years. Table 10 shows the growth and mortality by species and volume stratums for the regulated types. This was converted from Forest Survey Growth Stratum (Table FS-31 IBM Tabulation Binder) by applying the percentage of species in each volume stratum as shown in the stock and stand tables.

The periodic annual net growth and mortality for the three regulated types are:

Table 10

Sawtimber Types	Periodic Annual Net Growth		Periodic Annual Mortality	
	Per Acre B.F.	Expanded Total M B.F.	Per Acre B.F.	Expanded Total M B.F.
Douglas-fir	+15.07	1,206	3.1	248
Lodgepole Pine	+11.34	1,477	5.8	57
Spruce-Fir	+46.29	14,165	10.1	3,090
Total	34.80	16,848	7.0	3,395

Empirical yield tables are not available. It is estimated, however, that a potential annual growth of at least 100 board feet per acre could be obtained under management.

Mortality has been due largely to disease, since at least 50 percent of the sawtimber size stands are overaged. Losses from insects have been comparatively light, and infestations of Engelmann spruce bark beetle have been endemic only.

Prior to the end of this 10-year planning period, the rate of growth and mortality will be re-examined. If there is any appreciable change, the length of the adjustment period will be revised accordingly.

Calculation of Allowable Cut

Spruce-Fir Type

There are 306,094 acres of the spruce-fir sawtimber stand size class in the working circle. The distribution of site trees indicate that 49 percent of the type is past rotation age. By the year 2000 A.D. another 24 percent will have reached rotation age. The annual net growth per acre is 11.46 cubic feet or 46.29 board feet, Scribner Decimal C. The annual mortality is about one-fourth of the growth.

An adjustment period of 100 years is used to convert the type from wild to managed stands. This adjustment period will be subject to change if there is a material increase in the trend of mortality 10 years hence. It is estimated that 20 percent of the type is inoperable due to poor quality trees at timberline and inoperable volumes on steep,rocky slopes.

Table 11 shows the allowable cut by 10-year periods for the next 40 years. A tabulation method was used for this calculation.

This gives the annual allowable cut for the type for the first period as follows:

Area - 2,580 Acres

Volume - 7,900 M C.F. or
29,300 M B.F. Scribner Decimal C or
35,100 M B.F. International $\frac{1}{4}$"

The yield in cubic feet includes trees 5.0" d.b.h. and larger. For board feet it includes trees 9.0" d.b.h. and larger.

The converting factors from cubic feet to board feet from the stock and stand tables are:

Scribner Decimal C	3.71
International $\frac{1}{4}$"	4.44

The allowable cut compares with other methods of area calculations as follows:

Kemp formula

$$\frac{306{,}000 \times 7 + 66{,}000 \times 5 + 2{,}000 \times 3 + 17{,}000}{4 \times 140} = 4{,}460 \text{ acres}$$

4,460 acres x 0.80 (Operability Factor) = 3,570 acres per year.

3,570 acres x 11,397 board feet per acre = 41 MM B.F. (Scribner Decimal C) per year.

Straight area calculation based on rotation period.

$$\frac{391{,}000 \text{ acres}}{140 \text{ years}} = 2{,}790 \text{ acres}$$

2,790 acres x 0.80 (Operability Factor) = 2,230 acres per year.

2,230 acres x 11,397 board feet per acre = 25.4 MM B.F. (Scribner Decimal C) per year.

The yield broken down by species for each kind of volume is as follows:

Species	Cubic Feet M C.F.	Scribner Decimal C M B.F.	International $\frac{1}{4}$-Inch M B.F.
Douglas-fir	77	328	390
Lodgepole Pine	127	481	558
Subalpine Fir	1,946	5,502	6,697
Engelmann Spruce	5,750	22,989	27,455
Total	7,900	29,300	35,100

Lodgepole Pine Type

Sawtimber

There are 99,000 acres of lodgepole pine sawtimber type in the working circle. Seventy percent is now past rotation age and another 22 percent will become rotation age within the next 40 years. The periodic annual net growth is 2.54 cubic feet or 11.34 board feet per acre and the annual mortality in the type is 5.8 board feet per acre. Because of the age of the timber and the lack of adequate growth, a 40-year adjustment period is used to convert from wild to managed stands.

It is estimated that 10 percent of the stands are inoperable at this time due to unmerchantable volume on steep, rocky slopes.

Table 11 shows the allowable cut by 10-year periods for the next 40 years. A tabulation method was used for this calculation. The allowable cut is for a harvest cut in the sawtimber type. Volume from intermediate cutting in the poletimber type is not calculated due to the lack of a market for this size material. It is questionable if a market will develop during the next 10 years. If it does, this plan will be modified to place the lodgepole pine poletimber type under regulation.

The annual allowable cut for the lodgepole pine sawtimber type by area and kind of volume is:

Area - 2,250 Acres

Volume -4,200 M C.F. or
14,600 M B.F., Scribner Decimal C or
18,000 M B.F., International $\frac{1}{4}$"

The cubic foot yield includes trees 5.0" d.b.h. and larger, and the board foot yield includes trees 9.0" d.b.h. and larger.

The factors used to convert cubic feet to board feet from the stock and stand tables are:

Scribner Decimal C 3.48
International $\frac{1}{4}$" 4.29

The above allowable cut compares with other methods of area calculation as follows:

Kemp formula

$$\frac{99,000 \times 7 + 66,000 \times 5 + 9,000 \times 3 + 50,000}{4 \times 120} = 2,290 \text{ acres}$$

2,290 acres x 0.90 (Operability Factor) = 2,060 acres per year.

2,060 acres x 6,499 board feet per acre = 13.4 MM B.F. per year.

Straight area calculation based on sawtimber rotation period.

$$\frac{224,000 \text{ acres}}{120 \text{ years}} = 1,867 \text{ acres}$$

1,867 acres x 0.90 (Operability Factor) = 1,680 acres per year.
1,680 acres x 6,499 board feet = 10.9 MM B.F. per year.

The volume allowable cut broken down by species for each kind of volume is as follows:

Species	Cubic Feet M C.F.	Scribner Decimal C M B.F.	International $\frac{1}{4}$" M B.F.
Douglas-fir	100	400	500
Lodgepole Pine	3,500	12,100	15,000
Subalpine Fir	100	200	300
Engelmann Spruce	500	1,900	2,200
Total	4,200	14,600	18,000

Small Round Wood

In addition to the sawtimber allowable cut, there would be a residual volume in trees 5.0" to 8.9 " d.b.h. The stock and stand table shows there are 426.60 cubic feet per acre. This volume times the area allowable cut would be 961 M C.F. (10 M cords) per year. Since this averages less than five cords per acre, it is questionable if the residual stand by itself would be operable.

Douglas-fir Type

There are 111,000 acres of Douglas-fir type in the working circle. Of this, 72 percent is in sawtimber size stands and 28 percent is in poletimber size stands. The type occurs at the lower elevations and usually on steep, rocky slopes. The type was heavily cut over and burned over prior to the creation of the national forest. The sawtimber type is characterized by poorly stocked stands of low quality trees of sawtimber size. The trees run heavily to limbs. The major defect is shake. Due to the low quality of the trees and the character of the site, 75 percent of the type is estimated to be inoperable. The timber is of more value as a soil binder. Regeneration of the stand is a problem,since some of it lies in a heavily used winter game range.

Table 11 shows the allowable cut in area and cubic foot volume by 10-year periods for the next 40 years. A tabulation method was used for this calculation. The annual allowable cut for the next 10 years by area and kind of volume is:

Area - 530 Acres

Volume - 700 M C.F. or
2,350 M B.F.,Scribner Decimal C or
2,900 M B.F., International $\frac{1}{4}$"

The yield in cubic feet is from trees 5.0" d.b.h. and larger in the sawtimber type and for board feet 9.0" d.b.h. and larger.

The factors used to convert cubic feet to board feet are:

Scribner Decimal C	3.37
International $\frac{1}{4}$"	4.10

The volume annual allowable cut broken down by species for each kind of volume is as follows:

Species	Cubic Feet M C.F.	Scribner Decimal C M B.F.	International $\frac{1}{4}$" M B.F.
Douglas-fir	540	1,774	2,191
Ponderosa Pine	28	135	154
Lodgepole Pine	14	25	30
Subalpine Fir	47	105	127
Engelmann Spruce	71	311	398
Total	700	2,350	2,900

Estimated Allowable Cut After the Year 2000 A.D.

The spruce-fir type would continue on a cut based upon the sawtimber rotation. There should be no reduction in area or volume. A desirable distribution of age classes should be obtained beginning with the second rotation.

Beginning with the year 2000 A.D., the lodgepole pine type allowable cut will be based upon a rotation of 100 years or less with the objective of producing pulpwood or a similar product. This will maintain an allowable cut of some 2,000 acres with no reduction in volume, since under controlled stocking the land should produce from 1/3 to 1/2 cord per acre per year.

Nonregulated Types

Aspen is not regulated at this time due to the lack of markets. There are 251,000 acres in poletimber and larger stand size classes. The average volume per acre is 659 cubic feet or 7-3/4 cords per acre. The total expanded volume for the type is 1,943 M cords of wood in trees 5.0" d.b.h. and larger. Approximately 35 percent of the type is over 80 years of age. The annual net growth in the type is approximately 1.5 cubic feet.

Table 11

Allowable Cut Area and Volume
By 10-Year Periods

Period	Type	Area Allowable Cut	Volume Per Acre - Cubic Feet: Volume at Beginning of Period	Net Growth at Midpoint	Total Volume	Volume Allowable Cut MM C.F.	Factors to be Used to Convert Cubic Feet to Board Feet: Scribner Decimal C	International ¼"
1st	Spruce-Fir Sawtimber	25,800	3,010.30	57.30	3,067.60	79	3.71	4.44
	Lodgepole Pine Sawtimber	22,500	1,853.75	12.70	1,866.45	42	3.48	4.29
	Douglas-fir Sawtimber	5,300	1,239.20	18.60	1,257.80	7	3.37	4.10
2nd	Spruce-Fir Sawtimber	24,800	3,124.90	57.30	3,182.20	79		
	Lodgepole Pine Sawtimber	22,200	1,879.15	12.70	1,891.85	42		
	Douglas-fir Sawtimber	5,100	1,276.40	18.60	1,295.00	7		
3rd	Spruce-Fir Sawtimber	23,900	3,239.50	57.30	3,296.80	79		
	Lodgepole Pine Sawtimber	21,900	1,904.55	12.70	1,917.25	42		
	Douglas-fir Sawtimber	4,900	1,313.60	18.60	1,332.20	7		
4th	Spruce-Fir Sawtimber	23,100	3,354.10	57.30	3,411.40	79		
	Lodgepole Pine Sawtimber	21,600	1,929.95	12.70	1,942.65	42		
	Douglas-fir Sawtimber	4,700	1,350.80	18.60	1,369.40	7		
	Total Area							
	Spruce-Fir	97,600						
	Lodgepole Pine	88,200						
	Douglas-fir	20,000						

Cutting Budget

The cutting budget for this 10-year period is shown in Table 12. Selection of compartments in which cutting is scheduled was based on the age and condition of the sawtimber stands. The areas are also distributed over the working circle for an orderly progress of development in logging.

Table 12
Cutting Budget - F.Y. 1963-1972

Compartment No.	Name	Ranger District	Gross Saw-timber Area in Compt.	Lodgepole Pine Sawtimber Type Net Acres	Lodgepole Pine Sawtimber Type Volume MM B.F.	Spruce-Fir Sawtimber Type Net Acres	Spruce-Fir Sawtimber Type Volume MM B.F.	Douglas-fir-Ponderosa Pine Sawtimber Type Net Acres	Douglas-fir-Ponderosa Pine Sawtimber Type Volume MM B.F.	Total Volume MM B.F.
	Timber Under Contract But Uncut as of 6/30/62			4,000	26	11,320	129			155
001	Dorchester	Taylor River	13,879	500	3	2,000	23			26
003	Trail	Taylor River	8,550	2,000	13	500	6			19
013	Baldwin (Castle Creek)	Sapinero	12,320			500	6			6
015	Anthracite	Paonia	13,165			500	6			6
007	Slate (Copely Lake)	Taylor River	9,147			400	5			5
027	Ohio City (Roosevelt)	Tomichi	8,845	550	4					4
024	Pass Creek	Cebolla	10,720	800	5	100	1	1,500	6	12
023	Cochetopa	Cebolla	42,603	200	1	7,500	85	2,500	11	97
030	Middle Quartz	Tomichi	4,210	250	2					2
002	Upper Spring Creek	Taylor River	19,691	4,500	29	3,000	34			63
011	Soap Creek (Oregon Gulch)	Sapinero	18,955			100	1			1
008	Cement	Taylor River	11,064	1,000	6	1,000	11			17
028	Waunita-Dawson	Tomichi	12,160	500	3			600	3	6
034	Razor Creek	Tomichi	15,275	2,500	16	2,000	23	600	3	42
032	Long Branch	Tomichi	8,906	1,500	10					10
031	Agate-Marshall	Tomichi	23,355	2,000	13					13
026	Pitkin	Tomichi	5,370	2,000	13					13
Total				22,300	143	28,900	330	5,200	23	497

TRANSPORTATION

The road survey and construction program for the 10-year period has been scheduled in Table 13. This schedule is correlated with the cutting budget shown in Table 12.

Timber purchaser construction or a combination of purchaser and Forest Service construction will be required for the larger offerings. This is necessary since Government funds have never been adequate for the construction of all timber access roads.

All roads listed in Table 13 are primarily for the purpose of timber access. Where heavy all-purpose use of the road is anticipated, the Forest Service will finance from all-purpose funds any standard in construction above that required to remove the timber.

Right-of-Way Needs

Rights-of-way will be obtained sufficiently in advance of road construction to avoid delay in construction. Action to obtain rights-of-way will be taken in accordance with the road schedule shown in Table 14.

Table 13

Timber Access Road Development Program

F.Y. 1963 - 1972

Compartment		Road			Con-		Est.	Est.Cost	Total	Date	
No.	Name	Name	No.	Class	struction By		Miles	Per Mile M $	Cost M $	Survey Required	Remarks
002	Upper Spring Creek	Spring Creek	744	SH	Contract		14	11	150	F.Y.1963	Sell 1964
002	Upper Spring Creek	Rocky Brook	748	SN	Contract		4	10	43	F.Y.1963	Sell 1964
008	Cement	Cement Creek	740	SN	Contract		10	10	100	F.Y.1964	Sell 1965
001	Dorchester	Mysterious Lake	749	SN	Purchaser		6	8	48	F.Y.1963	Sell 1963
011	Soap Creek	Oregon	799	SN	Purchaser		3	10	30	F.Y.1964	Sell 1965
013	Baldwin	Castle Creek	728	SN	Purchaser		5	8	40	F.Y.1963	Sell 1964
015	Anthracite	East Fork	25605	SN	Purchaser		3	8	24	F.Y.1964	Sell 1965
023	Cochetopa	Kildeer	791	SN	Purchaser		2	8	16	F.Y.1963	Sell 1963
023	Cochetopa	Kildeer	791	SN	Contract		15	10	150	F.Y.1965	Sell 1966
023	Cochetopa	Sawtooth	806	SN	Purchaser		3	8	24	F.Y.1963	Sell 1964
023	Cochetopa	Roadmiller	808	SN	Purchaser		3	8	24	F.Y.1964	Sell 1965
031	Agate-Marshall	Lime Ridge	25189	SN	Contract		10	8	80	F.Y.1968	Sell 1969
031	Agate-Marshall	Agate Creek	25195	SN	Purchaser		5	8	40	F.Y.1968	Sell 1969
032	Long Branch	Long Branch	780	SN	Purchaser		5	10	50	F.Y.1967	Sell 1968
034	Razor Creek	Razor Creek	783	SN	Contract		9	8	72	F.Y.1966	Sell 1967

Table 14

Timber Access Right-of-Way Needs

Compartment		Road		No. of	Volume	Year
No.	Name	Name	No.	Easements	M B.F.	Needed
002	Upper Spring Cr.	Spring Cr.	744	2	63	1963
008	Cement	Cement Cr.	740	1	17	1964
013	Baldwin	Castle Cr.	728	1	6	1963
023	Cochetopa	Kildeer	791	2	60	1964

SALES POLICY

There is insufficient established plant capacity in the Gunnison Working Circle to utilize the allowable cut of sawtimber. To attract outside industry or expand the present local industry, large blocks of timber must be advertised. The average requirements of the existing and anticipated mills range from less than a million board feet to more than 20 million board feet per year. The size of the offerings will vary. The following is a guide for size of sales:

1. For the larger sawmills with a capacity of 20 to 30 MM B.F. per year, sales should be 100 to 300 MM B.F. in size.

2. For mills cutting 3 to 8 million feet per year, offerings should be from 10 to 20 million board feet.

3. For mills having smaller requirements, offerings will be from 1 to 5 million board feet.

Railheads to which timber within the working circle will be appraised are at Salida, Montrose, or Paonia. The point selected for a particular sale will normally be that of greatest advantage to the Government.

Merchantability Specifications

Product and Species	Specification
Sawtimber	Trees
All species	10.0" d.b.h.
All species	Top Diameter 8.0" d.i.b.
All species	Stump Height 12.0"

Logging Methods

Logging will be done in all types by trucks, animals, tractors and cable equipment. The method to be used will be discussed in the presale prescription and prospectus and will be specified in the timber sale contract.

In the spruce-fir type, special consideration will be given to practices and methods which will eliminate potential build-up of Engelmann spruce bark beetle populations in cull and large slash material. Complete slash disposal, entire tree skidding with slash and cull disposal at the landings, or other appropriate methods will be considered for approval on an individual case basis.

TIMBER STAND IMPROVEMENT

1. Regeneration

Planting - The forest inventory indicates there are 18,000 acres of commercial forest land which are nonstocked, 1,000 acres of seedling-sapling stands poorly stocked, 274,000 acres of aspen type, and 186,000 acres of noncommercial type. An examination of these stands will be made to determine planting needs. In addition, all spruce-fir sawtimber stands cut over will be planted with a minimum of 300 spruce or lodgepole seedlings per acre. It is estimated that 40 percent of the aspen stands and 60 percent of the oak brush type will require re-establishment of conifers by planting within the next 20 years. When lodgepole pine stands have failed to regenerate naturally within five years after logging, the area will either be seeded or planted.

Table 15 shows the planting job for the 10 and 20-year periods. Fencing for protection of plantations from livestock will be done where necessary.

Measures to Aid Natural Regeneration - Slash treatment, ground scarification, or other measures will be done to help obtain adequate regeneration. In the lodgepole pine type, slash treatment methods will be applied which aid in controlling the amount and distribution of reproduction.

2. Thinning

Noncommercial thinning and weeding will be done in overstocked stands of noncommercial size trees where site quality and age indicate that satisfactory response may be expected. Noncommercial thinnings will not be made in lodgepole pine stands over 70 years of age. Noncommercial thinning in the spruce-fir type will be limited in magnitude until stocking requirements are better developed.

Table 15

The Planting Job - 1963 to 1972

Type	Nonstocked	Understocked Seedling-Sapling Stands	Sawtimber Stands to be Cut After 1962	To Re-establish Conifers in Aspen Type	To Re-establish Conifers in Non-commercial Type	Total
	Acres	Acres	Acres	Acres	Acres	Acres
Lodgepole Pine	400					400
Spruce-Fir	5,000	400	25,000			30,400
Aspen				40,000		40,000
Noncommercial					40,000	40,000
Total	5,400	400	25,000	40,000	40,000	110,800

The Planting Job - 1963 to 1982

Type	Nonstocked	Understocked Seedling-Sapling Stands	Sawtimber Stands to be Cut After 1962	To Re-establish Conifers in Aspen Type	To Re-establish Conifers in Non-commercial Type	Total
	Acres	Acres	Acres	Acres	Acres	Acres
Lodgepole Pine	800					800
Spruce-Fir	10,000	800	50,000			60,800
Aspen				110,000		110,000
Noncommercial					110,000	110,000
Total	10,800	800	50,000	110,000	110,000	281,600

PROTECTION

Insects

Engelmann spruce bark beetle build-up has been noted in the Baldy Chato, Hall's Gulch, Black Mesa, Curecanti, and Bracken Creek areas.

Spruce-Fir Types

During the past 10-year period control action was undertaken on the Black Mesa.

On Recently Logged Spruce Areas

Continued observation of these areas is necessary. If there should be a marked build-up, control measures will be applied. The planned action for insect control is as follows:

All field-going personnel, timber purchasers and other key people will be given training in insect detection and reporting.

In the Lodgepole Pine Type

A continuing carefully administered detection program will be maintained so that potential epidemics can be recognized and controlled.

In the Spruce-Fir Type

All future sale contracts and modifications of existing contracts under which cutting will be done in the spruce-fir type will require the bunching and burning of all slash and cull material resulting either from tree length logging or from bucking in the woods. The method used will be that which is the most practicable. Burning will be done by the Forest Service during the period the bark beetles are in the cull material. On areas where bunching and burning does not control infestation or on small sales where such action is impracticable, trap trees will be used.

Disease

1. Sales With Sale Area Betterment Provisions

   Dwarfmistletoe infects 75 to 80 percent of the lodgepole pine type in this working circle. On sales having sale area betterment provisions the following action will be taken:

a. Where the residual stand is less than five cords per acre, poison, girdle or otherwise destroy the residual trees on all patches or cut strips.

b. Where the residual stand is five cords or greater, no control will be undertaken except with the approval of the Forest Supervisor.

2. Sales Without Sale Area Betterment Provision

Financing will be with regular P&M funds. The same cord per acre classification used in No. 1 will be applied.

Animals

1. Porcupines

a. All Forest Service employees will be instructed to kill porcupines.

b. Educate the public in the importance of controlling porcupines in timber management.

c. Use poison for control where necessary.

2. Livestock

All plantations will be fenced, if necessary, to protect the trees from livestock damage. The fences will be maintained until the trees are above browse height. Areas to be regenerated by natural means may be fenced, if necessary, for the protection of the reproduction against animal damage.

3. Wildlife

Plantations will not be established on heavily used winter game range.

Fire

Provision is made in current sales for treatment of slash or for extra protection for slash areas until the hazard has been abated naturally.

The program for fire protection during this 10-year period is:

1. Reduce all slash areas to at least an MM fuel class within two years after logging.

2. Maintain a supply of equipment and a protection organization adequate to keep commercial timberland fires within the annual PAR set up in the fire prevention plan. The equipment and organization necessary will be specified in the fire suppression plan.

3. Use fire where practicable for insect and disease control.

4. Provide, in all slash disposal plans, for the purchase of slash disposal equipment, such as tankers, chippers, pumps and firing equipment.

SUPPORTING DATA

Compartment Records

Within one year after the approval of this plan, a system of compartment records will be set up for each ranger district. This will consist of Form R2-2400-19 and a map for each compartment within the ranger district. These will be maintained in an atlas-size binder. The R2-2400-19 will be posted at least once annually. Since balances may be struck at any time, the form provides for a continuous inventory of the compartment. Compartment descriptions for at least those compartments scheduled for cutting during the 10-year period will also be included in the atlas binder. Such descriptions may be made on the back of Form 2400-19.

Timber Inventory

The inventory data on which this plan revision is made was obtained from the Cooperative Forest Survey - Region 2 Inventory Program conducted in 1957.

The inventory was conducted to standards prescribed and agreed to by Forest Survey of the Intermountain Forest and Range Experiment Station and the Division of Timber Management of Region 2 (Field Instructions for Forest Inventory, Rocky Mountain Region, 1956). Forest Survey read the plots and processed the data. Region 2 delineated the types on aerial photographs, transferred the types to planimetric maps, printed the final type maps and calculated the area of the types.

Sampling Error

Volume data was based on plots taken at 207 locations. Two plots were taken at each location. Table 18 shows the number of locations by volume stratum.

It was estimated that the above number of locations would give a sampling error not to exceed five percent (one standard error) for cubic foot volume for the working circle.

There is no sampling error for the area estimates since such were based upon a 100 percent mapping job.

Data Processing

Forest Survey of the Intermountain Forest and Range Experiment Station processed the data through the IBM Section of the Pacific Southwest Station.

This was done in accordance with the "Plan for Compilation of the Intermountain Forest Survey, Rocky Mountain Area By IBM Method," October 1, 1956, by Robert M. Miller.

The NFA Tables are on file in the Forest Supervisor's office. These are:

Area

NFA 2 - Compartment Area
NFA 3 - Block Area Summary
NFA 4 - Working Circle Area Summary

Volume

NFA 6 - Average Volume Per Acre By Volume Stratum
NFA 7 - Average Board Foot Volume Per Acre For Sawtimber Size Trees By Volume Stratum
NFA 24- Average Past Volume Per Acre By Volume Stratum (10 Years Past)

Miscellaneous Tables - Number of Trees Per Acre and Various Forest Survey Summaries

Copies of the plot tally sheets are on file in the Forest Supervisor's office.

Aerial photographs on which the photo interpretation was done are on file at the Denver Federal Record Storage Center.

Plates from which the type maps were printed are stored in the Division of Timber Management, Forest Service, Denver, Colorado.

Method for Calculating Periodic Annual Net Growth

NFA Table No. 31 in the IBM binder gives the average adjusted 10-year growth increment and the 10-year mortality by growth stratums, species, and two-inch d.b.h. classes. The volumes are shown in both board feet and cubic feet.

The growth stratum codes are as follows:

GS-01 = All conifer sawtimber stands.
GS-02 = All conifer poletimber stands.
GS-03 = All conifer seedling and sapling and nonstocked stands.
GS-04 = All hardwood stands.

The gross 10-year growth is based upon merchantability class (MC-1) trees. These are all live, merchantable trees. Mortality is shown under merchantability class (MC-7) trees. These are all mortality trees.

The Forest Survey crews estimated the trees that died during the past five years. This volume was then doubled to put it on the same period as the growth. The growth was based on the past 10 years.

The periodic annual net growth per acre can be determined for any given species and d.b.h. class within a growth stratum, or the total of all species in d.b.h. classes within a growth stratum, by subtracting the volume shown for the average 10-year mortality (MC-7) from the average 10-year growth increment (MC-1) and dividing by 10.

Growth stratums do not correspond to volume stratums. The total volume of timber in the working circle and the allowable cuts are based upon volume stratums. It was, therefore, necessary to construct a growth and mortality table for the volume stratums using the data given in NFA Table 31. This was done by weighting the growth and mortality of the species in the growth stratums by the percent of each species in the volume stratums.

Table 16

Distribution of Site Trees
By Major Forest Cover Types, Stand Size Classes, and Age Classes

Types	Age Class	Sawtimber No. Trees	Sawtimber Percent	Poletimber No. Trees	Poletimber Percent	Seedling-Sapling No. Trees	Seedling-Sapling Percent
Douglas-fir	1- 19	--	--	--	--	--	--
	20- 39	1	2	--	--	--	--
	40- 59	2	4	1	17	--	--
	60- 79	2	4	--	--	--	--
	80- 99	10	21	2	33	--	--
	100-119	5	11	--	--	--	--
	120-139	6	13	3	50	--	--
	140+	21	45	--	--	--	--
Total		47	100	6	100	--	--
Lodgepole Pine	1- 19	--	--	--	--	--	--
	20- 39	--	--	4	10	--	--
	40- 59	2	6	6	14	2	33
	60- 79	1	3	14	34	1	17
	80- 99	4	11	8	18	2	33
	100-119	4	11	4	10	1	17
	120+	25	69	6	14	--	--
Total		36	100	42	100	6	100
Subalpine Fir	1- 19	--	--	--	--	--	--
	20- 39	--	--	--	--	--	--
	40- 59	2	10	1	17	--	--
	60- 79	--	--	2	33	--	--
	80- 99	9	43	3	50	--	--
	100-119	--	--	--	--	--	--
	120-139	3	14	--	--	--	--
	140+	7	33	--	--	--	--
Total		21	100	6	100	--	--
Engelmann Spruce	1- 19	--	--	--	--	--	--
	20- 39	--	--	--	--	2	33
	40- 59	4	3	11	55	4	67
	60- 79	9	8	4	20	--	--
	80- 99	18	16	1	5	--	--
	100-119	14	12	2	10	--	--
	120-139	14	12	2	10	--	--
	140+	56	49	--	--	--	--
Total		115	100	20	100	6	100
Aspen	1- 19	--	--	--	--	--	--
	20- 39	--	--	3	5	--	--
	40- 59	1	6	20	32	10	63
	60- 79	4	22	26	41	5	31
	80- 99	6	33	9	15	1	6
	100-119	2	11	3	5	--	--
	120-139	3	17	--	--	--	--
	140+	2	11	1	2	--	--
Total		18	100	62	100	16	100

Table 17

Average Age and Height By Species
For Two-Inch D.B.H. Classes
Forest Survey Site Trees

Stand Size Class	D.B.H. 2" Classes	Douglas-fir Age Years	Douglas-fir Height Feet	Ponderosa Pine Age Years	Ponderosa Pine Height Feet	Lodgepole Pine Age Years	Lodgepole Pine Height Feet	Subalpine Fir Age Years	Subalpine Fir Height Feet	Engelmann Spruce Age Years	Engelmann Spruce Height Feet	Blue Spruce Age Years	Blue Spruce Height Feet	Aspen Age Years	Aspen Height Feet
Seedling-Sapling	½'ht.-0.9"	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	1.0-2.9	--	--	--	--	72	16	26	16	--	--	--	--	40	15
	3.0-4.9	--	--	--	--	76	24	--	--	43	26	--	--	57	30
Poletimber	5.0-6.9	--	--	--	--	78	34	70	34	72	31	--	--	60	40
	7.0-8.9	98	36	36	28	91	41	106	41	50	42	--	--	70	50
	9.0-10.9	--	--	--	--	70	40	--	--	73	37	--	--	81	60
Small Sawtimber	11.0-12.9	122	58	--	--	156	57	117	61	130	60	123	58	102	63
	13.0-14.9	146	61	--	--	147	48	82	67	188	68	121	66	104	72
	15.0-16.9	160	53	187	29	191	65	121	86	188	81	117	69	85	58
	17.0-18.9	179	60	--	--	208	76	107	80	154	83	127	77	--	--
	19.0-20.9	220	70	--	--	--	--	--	--	119	99	101	65	--	--
Large Sawtimber	21.0-22.9	334	52	--	--	--	--	--	--	--	--	--	--	--	--
	23.0-24.9	323	56	--	--	--	--	--	--	--	--	--	--	--	--

Table 18

Volume Per Acre, Area, and Total Volume By Volume Stratum and Ownership
Unreserved Commercial Forest Lands

Gunnison National Forest

Volume Stratum			No. of	Average Volume Per Acre			National Forest				State, County, etc.				Private Lands			
Description			Plot	Int.	Scribner	Cubic	Area	Total Net Volume			Area	Total Net Volume			Area	Total Net Volume		
No.	Type	SSC:SC	Locations	1/4"	Dec. C	Feet	Acres	Int. 1/4"	Scrib.	Cu. Ft.	Acres	Int. 1/4"	Scrib.	Cu.Ft	Acres	Int. 1/4"	Scrib.	Cu.Ft.
				BF	BF	CF		MBF	MBF	MCF		MBF	MBF	MCF				
1	Douglas-fir	LST:P	3	5,450.65	4,644.28	1,269.10	95:	517:	441:	121:	10:	55:	46:	13:	--	--	--	
2	Douglas-fir	SST:W&M	6	8,509.28	6,996.83	1,928.23	25,895:	220,348:	181,183:	49,932:	290:	2,468:	2,029:	559:	914:	7,777:	6,395:	1,762
3	Douglas-fir	SST:P	14	3,418.69	2,814.98	906.61	53,638:	183,372:	150,990:	48,629:	465:	1,590:	1,309:	422:	1,923:	6,574:	5,413:	1,743
4	Ponderosa Pine	SST:M&P	1	4,158.11	3,492.06	798.96	2,309:	9,601:	8,063:	1,845:	--	--	--	--	230:	956:	803:	184
5	Lodgepole Pine	SST:W&M	7	8,999.89	7,434.70	2,070.40	47,213:	424,912:	351,014:	97,750:	274:	2,466:	2,037:	567:	1,529:	13,761:	11,368:	3,166
6	Lodgepole Pine	SST:P	11	6,986.87	5,533.65	1,655.26	51,537:	360,082:	285,187:	85,307:	225:	1,572:	1,245:	372:	1,999:	13,967:	11,061:	3,309
7	Spruce-Fir	LST:All	2	24,003.19	21,183.90	4,249.13	750:	18,002:	15,888:	3,187:	--	--	--	--	200:	4,800:	4,237:	850
8	Spruce-Fir	SST:W	2	19,211.90	16,087.28	4,959.41	570:	10,951:	9,170:	2,827:	80:	1,537:	1,287:	397:	220:	4,227:	3,539:	1,091
9	Spruce-Fir	SST:M	29	18,034.20	15,144.58	3,959.38	162,608:	2,932,505:	2,462,630:	643,827:	150:	2,705:	2,272:	594:	4,722:	85,157:	71,513:	18,471
10	Spruce-Fir	SST:P	39	7,923.58	6,539.51	1,910.10	142,126:	1,126,146:	929,434:	271,475:	235:	1,862:	1,537:	449:	4,665:	36,963:	30,507:	8,911
24	Limber Pine	SST:P	0	610.00	442.00	770.59:	135:	82:	60:	104:	--	--	--	--	5:	3:	2:	4
Total Sawtimber			114	10,858.00	9,025.00	2,475.00	486,876:	5,286,518:	4,394,060:	1,205,004:	1,729:	14,255:	11,762:	3,373:	16,407:	174,182:	144,838:	39,491
11	Douglas-fir	PT:All	3			999.47:	31,336:			31,319:	235:			235:	852:			852
12	Lodgepole Pine	PT:W	5			1,830.50:	41,986:			76,855:	470:			860:	1,684:			3,083
13	Lodgepole Pine	PT:M	12			976.12:	68,580:			66,942:	360:			351:	3,761:			3,671
14	Lodgepole Pine	PT:P	4			253.83:	4,444:			1,128:	5:			1:	275:			70
15	Spruce-Fir	PT:W	4			1,955.57:	8,076:			15,793:	10:			20:	295:			596
16	Spruce-Fir	PT:M	5			1,096.11:	39,406:			44,321:	70:			77:	2,195:			2,406
17	Spruce-Fir	PT:P	5			550.93:	18,129:			9,988:	50:			28:	919:			506
25	Ponderosa Pine	PT:All	0	VS 18	SU 26	162.72:	2,444:			398:	40:			7:	265:			43
26	Limber Pine	PT:All	0	VS 20	SU 22	694.92:	2,990:			2,078:	0:			--	0:			--
Total Poletimber			38			1,144.00:	217,391:			248,822:	1,240:			1,579:	10,246:			11,227

(Table Continued)

Table 18 (Continued)

Volume Per Acre, Area, and Total Volume By Volume Stratum and Ownership
Unreserved Commercial Forest Lands

Gunnison National Forest

Volume Stratum Description			No. of Plot	Average Volume Per Acre			National Forest				State, County, etc.				Private Lands			
				Int. ¼"	Scribner	Cubic	Area	Total Net Volume			Area	Total Net Volume			Area	Total Net Volume		
No.	Type	SSC:SC	Locations	BF	Dec. C BF	Feet	Acres	Int. ¼" MBF	Scrib. MBF	Cu. Ft. MCF	Acres	Int. ¼" MBF	Scrib. MBF	Cu.Ft MCF	Acres	Int. ¼" MBF	Scrib.	Cu.Ft.
18	LodgepolePine	S-S:All	3			223.91	8,908			1,995	--	--	--	--	870			195
19	Spruce-Fir	S-S:All	2			21.97	1,865			41	--	--	--	--	85			2
27	Douglas-fir	S-S:All	0	No Volume			25			--					--			--
Total Seedling-Saplings			5				10,798			2,036	--	--	--	--	955			197
20	Spruce-Fir	NS -	2			144.17	16,942			2,443	40			6	717			103
28	Douglas-fir	NS	0	No Volume			395			--				--	--			--
28	LodgepolePine	NS	0	No Volume			610			--				--	5			--
Total Nonstocked			2				17,947			2,443	40			6	722			103
Total Conifers			159				733,012			1,458,305	3,009	14,255	11,762	4,953	28,330	174,182	144,838	51,018
21	Aspen	ST -	9			1,451.10	14,916			21,645	--	--	--	--	--	--	--	--
29	Hardwoods	ST -	0	VS 23 SU 29		91.13	199			18					155			14
Total Sawtimber			9				15,115			21,663	0	--	--	--	155	--	--	14
22	Aspen	PT -	31			608.45	235,541			143,315	1,599			973	11,280			6,863
30	Hardwoods	PT	0	No Volume			115				10				310			--
Total Poletimber			31				235,656			143,315	1,609	--	--	973	11,590	--	--	6,863
23	Aspen	S-S:	8			41.72	23,220			969	155			6	1,170			49
Total Hardwoods			48				273,991			164,978	1,764	--	--	979	12,915	--	--	6,926
Grand Total			207				1,007,003	5,286,518	4,394,060	1,623,283	4,773	14,255	11,762	5,937	41,245	174,182	144,838	57,944

Table 19

Summary of 10-Year Growth and Mortality By Kind of Volume and Volume Stratums
Sawtimber Types

Average Per Acre

Type, Stand Size Classes and Species	International ¼"				Scribner Decimal C				Cubic Feet			
		10-Year		Annual		10-Year		Annual		10-Year		Annual
		Gross		Net		Gross		Net		Gross		Net
	Percent	Growth	Mortality	Growth	Percent	Growth	Mortality	Growth	Percent	Growth	Mortality	Growth
		BF	BF	BF		BF	BF	BF		CF	CF	CF
Douglas-fir Sawtimber VS 1, 2 and 3												
Douglas-fir	72.6	78.47	13.31	+6.52	72.5	67.88	10.96	+5.69	74.2	19.61	2.46	+1.72
Ponderosa Pine	5.1	0.27	--	+0.03	5.5	0.27	--	+0.03	3.8	0.07	--	+0.01
Lodgepole Pine	1.0	1.13	0.64	+0.05	1.0	0.96	0.53	+0.04	1.9	0.45	0.31	+0.01
Limber Pine	0.9	--	--	--	0.9	--	--	--	1.1	--	--	--
Subalpine Fir	4.2	11.46	7.82	+0.36	4.3	10.15	6.80	+0.33	6.5	5.47	3.18	+0.23
Engelmann Spruce	13.2	103.62	14.27	+8.94	12.8	87.16	11.96	+7.52	9.8	16.65	1.87	+1.48
Blue Spruce	1.3	17.00	0.10	+1.69	1.3	14.70	0.08	+1.46	0.9	2.82	0.01	+0.28
Hardwoods	1.7	0.65	0.79	-0.01	1.7	0.56	0.67	-0.01	1.8	0.15	0.23	-0.01
Total	100	212.60	36.93	+17.57	100	181.68	31.00	+15.07	100	45.22	8.06	+3.72
Lodgepole Pine Sawtimber VS 4 and 5												
Douglas-fir	3.1	3.35	0.57	+0.278	3.2	3.00	0.48	0.252	2.7	0.71	0.09	0.062
Lodgepole Pine	83.3	94.22	52.98	+4.124	83.0	79.54	44.18	3.536	82.7	19.59	13.28	0.631
Subalpine Fir	1.0	2.73	1.86	+0.087	1.1	2.60	1.74	0.086	3.1	2.61	1.52	0.109
Engelmann Spruce	12.6	98.91	13.62	8.529	12.7	86.47	11.86	7.461	11.5	19.54	2.19	1.735
Total	100	199.21	69.03	13.02	100	171.61	58.26	11.34	100	42.45	17.08	2.54
Spruce-Fir Sawtimber VS 7, 8, 9 and 10												
Douglas-fir	1.1	1.19	0.20	+0.099	1.1	1.03	0.17	+0.086	0.9	0.24	0.03	+0.021
Lodgepole Pine	1.5	1.70	0.95	+0.075	1.6	1.53	0.85	+0.068	1.6	0.38	0.26	+0.012
Subalpine Fir	18.5	50.49	34.43	+1.606	18.2	42.97	28.79	+1.418	23.8	20.01	11.66	+0.835
Engelmann Spruce	75.8	595.05	81.95	+51.310	76.1	518.16	71.09	+44.707	70.2	119.29	13.39	+10.590
Blue Spruce	1.8	0.41	0.14	+0.027	1.7	0.33	0.11	+0.022	1.9	0.15	0.03	+0.012
Hardwoods	1.3	0.46	0.60	-0.014	1.3	0.40	0.51	-0.011	1.6	0.12	0.20	-0.008
Total	100	649.30	118.27	+53.10	100	564.42	101.52	+46.29	100	140.19	25.57	+11.46

Table 20

Summary of 10-Year Growth and Mortality By Volume Stratums
Poletimber Types

Type, Stand Size Class and Species	Average Per Acre: Percent	Gross Growth	Mortality	Annual Net Growth
		CF	CF	CF
Douglas-fir Poletimber Type				
Douglas-fir	100	10.55	6.50	+0.40
Lodgepole Pine Poletimber Type				
Douglas-fir	0.4	00.04	0.03	--
Lodgepole Pine	97.3	90.70	9.94	+8.07
Engelmann Spruce	2.3	1.39	--	+ .14
Total	100	92.13	9.97	+8.21
Spruce-Fir Poletimber Type				
Douglas-fir	2.4	0.25	0.16	+0.01
Lodgepole Pine	5.9	5.50	0.60	+0.49
Subalpine Fir	23.8	6.76	2.94	+0.38
Engelmann Spruce	62.4	37.84	--	+3.78
Aspen	5.5	0.50	0.06	+0.04
Total	100	50.85	3.76	+4.70
Aspen Poletimber Type				
Douglas-fir	1.5	0.16	0.10	0.01
Lodgepole Pine	0.6	0.56	0.06	0.05
Subalpine Fir	3.7	1.05	0.46	0.06
Engelmann Spruce	11.5	6.97	--	0.70
Blue Spruce	2.4	--	--	--
Aspen	80.3	7.24	0.91	0.63
Total	100	15.98	1.53	1.45

Table 21

Distribution of Species in Douglas-fir Sawtimber Type
By Volume Stratums

Average Net Volume Per Acre

Volume Stratum					Species									Area in Volume Stratum	
No.	Type	Stand Size Class	Stocking Class	Kind of Volume	Douglas-fir	Ponderosa Pine	Lodgepole Pine	Limber Pine	Subalpine Fir	Engelmann Spruce	Blue Spruce	Aspen	Total	Acres	Percent
1	Douglas-fir	Large Sawtimber	Poor	Inter. ¼" B.F.	5,373.99				76.66				5,450.65	95	00.12
				Scrib. B.F.	4,580.95				63.33				4,644.28		
				Cubic Feet	1,134.09				15.53				1,269.10		
2	Douglas-fir	Small Sawtimber	Medium	Inter. ¼" B.F.	5,892.63		64.41		445.70	1,708.23	126.65	271.66	8,509.28	25,895	32.52
				Scrib. B.F.	4,894.34		54.82		375.04	1,338.81	109.96	223.86	6,996.83		
				Cubic Feet	1,397.96		11.44		133.90	311.56	22.45	50.92	1,928.23		
3	Douglas-fir	Small Sawtimber	Poor	Inter. ¼" B.F.	2,618.94	384.69	43.87	66.39	101.31	169.85	33.64	--	3,418.69	53,638	67.36
				Scrib. B.F.	2,125.83	341.16	36.31	55.20	85.02	142.86	28.60	--	2,814.98		
				Cubic Feet	688.02	70.09	28.95	19.80	54.75	30.50	6.00	8.50	906.61		
Weighted Average 1,2 & 3	Douglas-fir	Sawtimber	All	Int. ¼" Volume	3,685.46	259.13	50.50	44.72	213.28	669.93	63.84	88.34	5,075.20	79,628	100.00
				Percent	72.6	5.1	1.0	0.9	4.2	13.2	1.3	1.7	100		
				Scrib. Volume	3,028.19	229.80	42.29	37.18	179.31	531.61	55.02	72.80	4,176.20		
				Percent	72.5	5.5	1.0	0.9	4.3	12.8	1.3	1.7	100		
				Cu.Ft. Volume	919.51	47.21	23.22	13.34	80.44	121.86	11.34	22.28	1,239.20		
				Percent	74.2	3.8	1.9	1.1	6.5	9.8	0.9	1.8	100		

Table 22

Average Net Volume Per Acre By Species and Stocking Classes

PONDEROSA PINE SAWTIMBER TYPE

Species	Small Sawtimber Poor VS-4			Percent of Species Based on		
	Int. $\frac{1}{4}$"	Scrib.	Cubic Ft.	Int. $\frac{1}{4}$"	Scrib.	Cubic Ft.
	BF	BF	CF			
Douglas-fir	2,217.93	1,920.40	419.20	53.34	55.00	52.47
Ponderosa Pine	1,940.18	1,571.66	379.76	46.66	45.00	47.53
Total	4,158.11	3,492.06	798.96	100.00	100.00	100.00

Area in Volume Stratum

Acres 2,309

Percent 100.00

Table 23

Average Net Volume Per Acre By Species and Stocking Classes

LODGEPOLE PINE SAWTIMBER TYPE

Species	Small Sawtimber						Weighted Average					
	Medium VS-5			Poor VS-6			Net Volume			Percent of Species Based on		
	Int. ¼"	Scrib. Dec. C	Cubic Feet	Int. ¼"	Scrib. Dec. C	Cubic Feet	Int. ¼"	Scrib. Dec. C	Cubic Feet	Int. ¼"	Scrib. Dec.C	Cubic Feet
	BF	BF	CF	BF	BF	CF	BF	BF	CF			
Douglas-fir	40.98	32.14	16.57	428.44	362.65	81.71	243.20	204.63	50.57	3.06	3.18	2.73
Lodgepole Pine	7,544.46	6,226.82	1,705.36	5,774.43	4,542.65	1,374.75	6,620.67	5,347.85	1,532.81	83.29	83.00	82.69
Subalpine Fir	62.28	50.86	76.76	100.55	87.65	38.30	82.25	70.06	56.69	1.03	1.09	3.05
Engelmann Spruce	1,352.17	1,124.88	271.71	683.45	540.70	160.50	1,003.17	820.00	213.67	12.62	12.73	11.53
Total	8,999.89	7,434.70	2,070.40	6,986.87	5,533.65	1,655.26	7,949.29	6,442.54	1,853.74	100.00	100.00	100.00

Area in Volume Stratum

Acres	47,213	51,537	98,750
Percent	47.81	52.19	100.00

Table 24

Distribution of Species In
LODGEPOLE PINE POLETIMBER TYPE
By Volume Stratums

Average Net Volume Per Acre

Species	Stocking Classes: Well VS-12	Medium VS-13	Poor VS-14	Weighted Average: Volume	Percent
	CF	CF	CF	CF	
Douglas-fir	--	7.32	--	4.36	0.35
Lodgepole Pine	1,830.50	919.36	253.83	1,226.31	97.31
Engelmann Spruce	--	49.44	--	29.48	2.34
Aspen	--	--	--	--	--
Total	1,830.50	976.12	253.83	1,260.15	100.00

Area in Volume Stratum				
Acres	41,986	68,580	4,444	115,010
Percent	36.51	59.63	3.86	100.00

Table 25

Average Net Volume Per Acre By Species and Stocking Classes

SPRUCE-FIR SAWTIMBER TYPE

Species	Large Sawtimber: Well and Poor VS-07			Small Sawtimber: Well VS-08			Small Sawtimber: Medium VS-09			Small Sawtimber: Poor VS-10			Weighted Average			Percent of Species Based on		
	Int. ¼" BF	Scribner Dec. C BF	Cubic Feet CF	Int. ¼" BF	Scribner Dec. C BF	Cubic Feet CF	Int. ¼" BF	Scribner Dec. C BF	Cubic Feet CF	Int. ¼" BF	Scribner Dec. C BF	Cubic Feet CF	Int. ¼" BF	Scribner Dec. C BF	Cubic Feet CF	Int. ¼"	Scrib. Dec.C	Cubic Feet
Douglas-fir	--	--	--	--	--	--	164.25	141.19	31.02	122.60	98.93	25.27	144.19	120.94	28.21	1.1	1.1	0.9
Lodgepole Pine	--	--	--	977.50	856.75	172.68	304.52	263.02	62.20	92.65	78.20	29.03	206.64	177.66	46.85	1.5	1.6	1.6
Subalpine Fir	7,238.00	6,206.75	1,404.33	4,113.00	3,519.00	1,679.86	3,312.23	2,751.82	949.67	1,472.71	1,183.58	440.51	2,469.29	2,033.62	715.74	18.5	18.2	23.8
Engelmann Spruce	16,765.19	14,977.15	2,844.80	14,121.40	11,711.53	3,106.87	14,037.73	11,805.09	2,867.69	5,598.82	4,664.40	1,245.78	10,125.68	8,496.71	2,114.87	75.8	76.1	70.2
Blue Spruce	--	--	--	--	--	--				522.71	416.01	121.49	242.75	193.20	56.41	1.8	1.7	1.9
Aspen	--	--	--	--	--	--	215.47	183.46	48.80	55.68	47.15	37.36	140.32	119.35	43.27	1.1	1.1	1.4
Other Hardwoods	--	--	--	--	--	--	--	--	--	58.41	51.24	10.66	27.13	23.80	4.95	0.2	0.2	0.2
Total	24,003.19	21,183.90	4,249.13	19,211.90	16,087.28	4,959.41	18,034.20	15,144.58	3,959.38	7,923.58	6,539.51	1,910.10	13,356.00	11,165.28	3,010.30	100.0	100.0	100.0

Area in Volume Stratum

Acres	750	570	162,608	142,126	306,054
Percent	0.25	0.19	53.12	46.44	100.00

GPO 856567

Table 26

Distribution of Species in Spruce-Fir Poletimber Type
By Volume Stratums

Species	Average Net Volume Per Acre: Stocking Classes: VS-15 Well C.F.	VS-16 Medium C.F.	VS-17 Poor C.F.	Weighted Average: Volume C.F.	Percent
Douglas-fir	202.72	--	--	24.95	2.37
Lodgepole Pine	266.04	48.48	--	61.87	5.89
Subalpine Fir	594.78	199.81	206.23	250.21	23.80
Engelmann Spruce	762.09	778.46	344.70	656.60	62.46
Aspen	129.94	69.36	--	57.65	5.48
Total	1,955.57	1,096.11	550.93	1,051.28	100.00
Area in Volume Stratum-Acres	8,076	39,406	18,129	65,611	
Percent	12.31	60.06	27.63	100.00	

Table 27

Distribution of Species In
Aspen Sawtimber and Poletimber Types

Average Net Volume Per Acre

Species	Sawtimber VS-21		Poletimber VS-22		Weighted Average	
	Volume	Percent	Volume	Percent	Volume	Percent
	CF		CF		CF	
Douglas-fir	30.14	2.1	8.99	1.5	10.26	1.6
Lodgepole Pine			3.51	0.6	3.30	0.5
Subalpine Fir	208.85	14.4	22.67	3.7	33.84	5.1
Engelmann Spruce	123.58	8.5	69.78	11.5	73.01	11.1
Blue Spruce			14.85	2.4	13.96	2.1
Aspen	1,088.53	75.0	488.65	80.3	524.64	79.6
Total	1,451.10	100	608.45	100	659.00	100

Area in Volume Stratum			
Acres	15,115	235,656	250,771
Percent	06	94	100

2400
COMPARTMENT MAP
GUNNISON WORKING CIRCLE

LEGEND

Compartment boundary ——

Block boundary ▬▬

Cutting Budget

Revised 1/62

1-MUDDY BLOCK

2-CRESTED BUTTE BLOCK

1-TAYLOR PARK BLOCK

4-NORTH FORK BLOCK

2-CRESTED BUTTE BLOCK

6-Q.T. BLOCK

3-SAPINERO BLOCK

6-Q.T. BLOCK

5-CEBOLLA BLOCK

5-CEBOLLA BLOCK

21 - GUNNISON NATIONAL FOREST

1 - Gunnison Working Circle

1.- Taylor Park Block

001 Dorchester
002 Upper Spring
003 Trail
004 Texas
005 Tincup

2 - Crested Butte Block

006 Brush
007 Slate
008 Cement
009 Taylor Canyon

3 - Sapinero Block

010 Curecanti
011 Soap Creek
012 Steuben
013 Baldwin
014 West Elk #1

4 - North Fork Block

015 Anthracite
016 Coal Creek
017 Paonia
018 Black Mesa
019 West Elk #2

5 - Cebolla Block

020 Sawtooth
021 Cebolla
022 Lake City
023 Cochetopa
024 Pass Creek
041 La Garita

6 - Q-T Block

025 North Quartz
026 Pitkin
027 Ohio City
028 Waunita-Dawson
029 White Pine
030 Middle Quartz
031 Agate-Marshall
032 Long Branch
033 Needle
034 Razor Creek

7 - Muddy Block

035 Clearfork-Huntsman
036 East Muddy
037 West Muddy
038 Hubbard
039 Terror
040 Chair-Ragged Mtn.

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

GUNNISON
NATIONAL FOREST
COLORADO
NEW MEXICO AND SIXTH PRINCIPAL MERIDIANS

*1959

Scale 1/2 0 1 2 3 4 5 Miles

LEGEND

- National Forest Boundary
- Adjacent National Forest Boundary
- Good motor road
- Poor motor road
- Trail
- Railroad
- Telephone line
- Supervisor's Headquarters / District ranger station (Report fires here)
- Compartments in which cutting is scheduled during 1962–1972
- Roads to be constructed
- Guard or ranger station (not permanently occupied)
- House, cabin, or other building
- Schoolhouse
- Commercial or municipal air field
- Improved recreation area
- Improved picnic ground
- Wild area (less than 100,000 acres)
- Triangulation station

*Reprint of 1949 edition with boundary changes to Oct 1, 1954

Revised Boundary 10-1-54 RFB

Compiled at Regional Office, Denver from Forest Service aerial surveys, B.L.M., U.S.G.S. and other surveys, by R.F. Burrus and F.E. Washburn. Drawn by R.F. Burrus, 1949.

Polyconic projection
North American datum

Longitude west from Greenwich